# RESEARCHES ON POPULATION ECOLOGY

Volume 22

1980

PUBLISHED BY
THE SOCIETY OF POPULATION ECOLOGY

*c/o* Japan Academic Societies Center
Yayoi 2-4-16, Bunkyo-ku, Tokyo 113, Japan

RESEARCHES ON POPULATION ECOLOGY

Volume 22

## CONTENTS


Ayertey, J. N.: Elimination of *Sitoroga cerealella* (Olivier) by *Sitophilus zeamais* Motschulsky from mixed laboratory cultures on maize ····101

Barclay, H. and M. Mackauer: Effects of sterile insect releases on a population under predation or parasitism ····136

Coulson, R. N., P. E. Pulley, D. N. Pope, W. S. Fargo and L. J. Edson: Continuous population estimates for *Dendroctonus frontalis* Zimm. (Coleoptera: Scolytidae) occurring in infestations ····117

Eguchi, K.: The feeding ecology of the nestling great tit, *Parus major minor*, in the temperate ever-green broadleaved forest. II. With reference to breeding ecology ····284

Erdman, H. E.: Population structural changes in single species of flour beetles with ozone as an environmental factor ····211

Fernando, M. H. J. P. and M. P. Hassell: Predator-prey responses in an acarine system ····301

Higashiura, Y.: Analysis of factors affecting bird predation on gypsy moth egg masses by using Holling's disc-equation····147

Johnson, D. L. and W. G. Wellington: Predation of *Apochthonius minimus* (Pseudoscorpionida: Chthoniidae) on *Folsomia candida* (Collembola: Isotomidae). I. Predation rate and size-selection····339

Johnson, D. L. and W. G. Wellington: Predation of *Apochthonius minimus* (Pseudoscorpionida: Chthoniidae) on *Folsomia candida* (Collembola: Isotomidae). II. Effects of predation on prey populations ····353

Kasuya, E.: Behavioral ecology of Japanese paper wasps, *Polistes* spp. (Hymenoptera: Vespidae). I. Extranidal activities of *Polistes chinensis antennalis*····242

Kasuya, E., Y. Hibino and Y. Itô: On "intercolonial" cannibalism in Japanese paper wasps, *Polistes chinensis antennalis* Pérez and *P. jadwigae* Dalla Torre (Hymenoptera: Vespidae) ····255

Kobayashi, S.: A model of the species rank-abundance relation for a community in an open habitat····51

Lavie, B.: Competitive ability as a function of sensitivity to the environment. I. Competition between *Tribolium castaneum* and *Tribolium confusum* in a deteriorating environment ····221

Lombardo, D. L. and C. R. Terman: The influence of the social environment of sexual maturation of female deermice (*Peromyscus maniculatus bairdi*)····· 93

Miyano, S.: Life tables of colonies and workers in a paper wasp, *Polistes chinensis antennalis*, in central Japan (Hymenoptera: Vespidae) ····· 69

Nagamine, M. and Y. Itô: "Predator-foolhardiness" in an epidemic cicada population····· 89

Ohsaki, N.: Comparative population studies of three *Pieris* butterflies, *P. rapae*, *P. melete* and *P. napi*, living in the same area. II. Utilization of patchy habitats by adults through migratory and non-migratory movements ····163

Pope, D. N., R. N. Coulson, W. S. Fargo, J. A. Gagne and C. W. Kelly: The allocation process and between-tree survival probabilities in *Dendroctonus frontalis* infestations ····197

Sokoloff, A., J. C. Albers, P. Cavataio, S. K. Mankau, S. McKibben, S. Mills, R. Perkins, L. D. Roberts and J. J. Sandri: Observations on populations of *Tribolium brevicornis* (Le Conte) (Coleoptera, Tenebrionidae). I. Laboratory observations of domesticated strains ····
Sugimoto, T.: Models of the spatial pattern of egg population of Ranunculus leaf mining fly, *Phytomyza ranunculi* (Diptera: Agromyzidae), in host leaves ····
Suzuki, H. and M. Murai: Ecological studies of *Roparidia fasciata* in Okinawa island. I. Distribution of single- and multiple-foundress colonies····18
Suzuki, N., Y. Kunimi, S. Uematsu and K. Kobayashi: Changes in spatial distribution pattern during the larval stage of the fall webworm, *Hyphantria cunea* Drury (Lepidoptera: Arctiidae)····27
Suzuki, Y. and Y. Iwasa: A sex ratio theory of gregarious parasitoids ····36
White, N. D. G. and R. N. Sinha: Principal component analysis of interrelations in stored-wheat ecosystems infested with multiple species of insects ····
Wollkind, D. J., A. Hastings and J. A. Logan: Functional response, numerical response, and stability in Arthropod predator-prey ecosystems involving age structure ····32
Wool, D.: On ecological inference from kurtosis and skewness of morphological characters ····26
Zurlini, G. and A. S. Robinson: The effect of crowding on adult populations of *Delia* (=*Hylemya*) *antiqua* (Meigen) ····22